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ABSTRACT

The economic impact, both beneficial and adverse, of Andrews University in the local area was studied. Questionnaires were prepared and distributed to a random sample of faculty, staff, and administrators; a random sample of the student body; and a select number of business establishments. More than 90 percent of the faculty, staff, administrators, and students sampled responded and all of the businesses responded. Other data were gleaned from the University records and various local government offices as detailed in Appendix A. The study showed that Andrews University, like most other enterprises, is a definite economic advantage to the local community. Its economic impact is definitely and considerably positive. The University creates jobs, enlarges the local credit base, and increases local business volume, and through the payment of its students, staff, and faculty, it increases local tax revenues. (Author/SPG)

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THE ECONOMIC IMPACT OF ANDREWS UNIVERSITY

1976 - 1977

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HIGHLIGHTS OF THE ANDREWS UNIVERSITY ECONOMIC IMPACT STUDY

The study showed that Andrews University, in 1976-1977, had an economic impact of $20,079,000 in the area contained within a 40 mile radius of the campus. Considering a very conservative inflation rate of 5 percent and a relatively constant economic condition, this would be an impact of $201,323,000 on the local economy for the eight fiscal year period, 1978-1987.

These figures reflect the primary, secondary, and tertiary business transactions of the University and its students, staff, and faculty. Due to the existence of the University in the area, the local credit base was expanded by $5,722,000, thus providing a stimulant for local economic growth.

The unrealized business in the local economy due to University owned enterprises was $6,629,000, but this sum was significantly smaller than the University generated business volume of $20,079,000.

The unrealized taxes due to the tax exempt status of the University amounted to $88,000, which was a small fraction as compared to the $1,248,000 of University-related taxes that were paid to the local government.

For every dollar expended by the University and its students, staff, and faculty in the local economy, an extra 76 cents was generated in the local area. For every full-time employee of the University, 1.32 extra jobs were created in the local economy. The presence of the

University in the locality created a total of 1,899 jobs. Stated in another way, for every 1.35 University students, one job, including University jobs, was created in the local area.

The impact of the University on the larger area, namely that within a 200 mile radius, was $35,998,000, and the capital investment dedicated to University-related business in that larger area was $41,039,000.

ANDREWS UNIVERSITY LOCAL ECONOMIC IMPACT

1976 - 1977

	Within 40 mile radius	Within 200 mile radius
B. ECONOMIC IMPACT ON BUSINESS		
B-1 University-Related Local Business Volume	$20,079,000	$35,998,000
B-2 Value of Local Business Property Committed to University-Related Business	22,867,000	41,039,000
B-3 Expansion of the Local Banks' Credit Base Resulting from University-Related Business	5,722,000	6,709,000
B-4 Local Business Volume Unrealized Because of Existence of University Enterprises	6,629,000	6,814,000
G. ECONOMIC IMPACT ON LOCAL GOVERNMENT		
G-1 University-Related Revenues Received by Local Government	$ 1,260,000	
G-2 Operating Cost of Local Government-Provided Municipal and Public School Services Allocable to University-Related Influences	227,000	
G-3 Value of Local Government's Properties Allocable to University-Related Portion of Services Provided	343,000	
G-4 Real-Estate Taxes Foregone through the Tax-Exempt Status of the University	87,919	
G-5 Value of Municipal-Type Services Self-Provided by the University	57,943	
I. IMPACT ON JOB CREATION AND JOB MAINTENANCE		
I-1 Number of Local Jobs Attributable to the Presence of the University	1,899 jobs	2,390 jobs
I-2 Personal Income of Local Individuals from University-Related Jobs and Business Activities	$16,639,000	$20,711,000
I-3 Durable Goods Procured with Income from University-Related Jobs and Business Activities	499,000	621,000

CHAPTER I

INTRODUCTION

The traditional role of educational institutions from elementary through university levels has been to educate students. In addition to this role, institutions of higher education are expected to be involved in research activities and in providing various services to their communities. Educational institutions usually have a second role that is frequently not considered. This role concerns their economic contribution to the areas in which they are located. Colleges and universities are major employers in their local areas, and together with their employees, they are major consumers of goods and services in their communities.

Colleges and universities are often regarded by local residents as having adverse economic effects upon the areas where they are located. For example, their exempt status for property taxes and their use of services provided by the local community are sometimes regarded as liabilities. Area citizens are often unaware of the economic benefits that a college or university brings them.

Andrews University is located in the small community of Berrien Springs in southwestern Michigan. It has an annual budget of approximately $24 million and employs 617 full-time administrators, faculty, and staff members, and 177 part-time employees. During the 1977 spring quarter, 1,380 students were also employed. The University is a major employer

in the area. Much of the income of these employees is spent locally. Many of the 2,830 students enrolled in 1977 also shop locally and some of them rent from area landowners. Many University employees own or are purchasing their homes in the area and pay local taxes. The University and both students and employees bank locally, which helps to increase the loan-lease for area financial institutions.

From the above figures, it appears that the University is responsible for a considerable portion of the area expenditures and contributes significantly to the local economy. However, the University occupies 1,300 acres of land that would otherwise be taxable and uses services provided by local governmental units. Thus, the University seems to be a liability as well as an asset to the area.

Statement of the Problem

Andrews University, like every major employer, has an economic impact on the local area. Before the undertaking of this study, the size of the impact was not known. The problem of the study was the absence of systematized data and computations that clearly describe both the positive and negative economic impact of the University.

Purpose of the Study

This study was undertaken to determine, in terms of expended funds, the economic impact of Andrews University on the local area. In other words, the study attempted to determine the economic benefits that Andrews University brings to the area where it is located. Further, the study also sought to determine the adverse economic effects of Andrews University upon the local area.

Need for the Study

An impact study of this nature should benefit both the University and the people of the surrounding area. A knowledge of the economic benefits that accrue to area businesses and citizens could be of particular value in the public relations program of the University. An understanding of the interrelationships between the economies of the community and the University and of the benefits to both from this mutual dependency could lead to greater cooperation between community and University.

In the manual of the American Council on Education (ACE) entitled Estimating the Impact of a College or University on the Local Economy (Caffrey and Isaacs, 1971) it was suggested that

> . . . data concerning the economic character of a college would be useful [1] in the occasional struggles that occur between institutions and those persons concerned with taxes or other economic factors in the local economy, [2] in development of plans for the expansion of a college or university, [3] in land-use studies, and [4] in appeals to local business and industry to support higher education (p. xi).

Definitions

The University impact is the influence of the University on the local community. There are many areas of impact: social, cultural, economic, educational, spiritual, etc. This study was only concerned, however, with the economic impact.

The multiplier effect is seen when a job or cash payment is put into the economy, then recycled through the economy, and in so doing, is increased in size each time it is recycled. To calculate the multiplier effect the original amount plus the amount generated is divided by the original amount. The result is usually a small figure varying from slightly more than 1 to approximately 3 in most applications.

To determine the impact of a transaction in an economy it is necessary to know the multiplier effect and then to multiply the multiplier effect by the amount of the transaction.

There are two main multiplier effects used in most impact studies: 1) the job multiplier effect where certain jobs create more jobs; and 2) the economic multiplier effect. These multipliers can further be broken down to measure their influence on individual sections of the economy. The total effect is equal to the sum of all the multiplier effects for each phase of the economy.

Population

The list of all faculty and staff (818) with their addresses and a list of all students enrolled in the University with their addresses was obtained from the Andrews University computer center. Then the size of the sample that was needed was determined, using the formula given by the National Education Association (1960). Since the proportion was not known, it was assumed to be .5. The formula then becomes

$$L = (X^2) \div (4 \times d^2)$$

X^2 is equal to 3.841 and d^2 is equal to the error. In a survey such as this the error will be very large as people reporting generally do not know just what their actual expenditures are. Thus, the actual responses would have a greater error than the normal sampling error of 5 percent.

It was also felt that the sample size needed for an error of 5 percent was too large and the error caused by non-response would not justify the expense of conducting a survey with a 5 percent error. Because of this, the projected error level was set at 10 percent. This gives a sample size of 96 for infinite population. Since the population

for this survey was not infinite, it was possible to reduce the sample size by using the formula

$$n = NL \div (N + L - 1)$$

which gave a sample size for faculty and staff of 86. Of the first 96 students selected in the random sampling, it was discovered that 7 had dropped out of school. In order to compensate for this, the sample size was increased to 103.

The final response rate for both students and faculty was better than 90 percent. If a 100 percent response rate had been obtained, the error could have been calculated by using the following formula:

$$E = \frac{Z_{(1-\alpha/2)}\ \sigma}{\bar{X}\quad \sqrt{n}} \times 100\%$$

The sampling error of the faculty and staff survey was equal to 7.1 percent for question 9 and 9.9 percent of the mean for question 4a. These percentages were less than the first estimated 10 percent.

Since these figures were based on the assumption of a 100 percent response rate, to account for the 10 percent non-response rate, it was assumed that the bias caused by the non-response would be no greater than one standard deviation. Then the following equation would be used:

$$E = \frac{Z_{(1-\alpha/2)}\ \sigma}{\sqrt{n}} + \omega\sigma \times \frac{100\%}{\bar{X}}$$

With ω representing the proportion of non-respondants, the total error due to sampling and non-response was equal to 10.5 percent for question 9 and 14.5 percent for question 4a. Most error rates for the questions in the questionnaire fell between 10.5 percent and 14.5 percent, but the error rates for certain questions such as questions 6 and 8c would be higher due to the higher standard deviation. These error rates were well within the accepted guidelines for this study.

Delimitations

This impact study was delimited as described below. The areas affected by the economic impact of the University were limited to 1) an area within a 40 mile radius, and 2) an area within 200 miles but outside the 40 mile radius. The study concerned itself with short-range economic effects rather than with the ultimate economic impact of the University upon the area.

Emphasis was given to the use of linear cash-flow formulas and included only that which could be readily counted or added; no attempt was made to study qualitative issues such as the quality of life, the stability of economic activity, etc. The study was concerned with the effects of institutionally related expenditures, not with revenues. Since the primary focus of the study was upon short-term economic effects, the results of the study can only be used for predictive purposes on the assumption that the functional relationships among the variables studied will remain unchanged over a period of time.

The study was of such a nature that exact and meaningful dollar values were not obtainable. In a sense, since multipliers were used, all outcome numbers are estimates. Every effort has been made to keep the estimates used in this study as conservative as reasonably practical.

CHAPTER II

REVIEW OF RELATED LITERATURE

During the late 1950's interest in assessing the economic impact of a college or university upon the area surrounding it began to develop. In The Economic Impact of Institutions of Higher Education on Local Communities: An Annotated Bibliography (Fink, 1976) more than 70 studies, undertaken between 1958 and 1974, were described. The general economic impact studies discussed in this bibliography were divided into three groups as follows:

1. Studies of economic relationships that did not use the American Council on Education (Caffrey & Isaacs, 1971) methodology, most of which preceded the American Council on Education (ACE) publication
2. Studies of economic relationships that used the ACE methodology
3. Studies of the economic impact of the various branches of the University of California upon their surrounding areas.

The ACE publication mentioned above was the most significant of all college and university economic impact studies. Eighteen of the studies in Fink's annotated bibliography were based on the ACE methodology. Since 1974, several more impact studies have followed or have been strongly influenced by this methodology, including those of Eastern Illinois University (Bryce, 1975), Indiana University-Purdue University (Shipchandler and Sunday, 1977), St. Cloud State University (Gamber, 1976), and Shippensburg State College (Miklausen and Smith, 1975). The ACE publication was designed as a "how-to-do-it" manual for estimating

the impact of an institution of higher education upon the economy of its local area. Therefore, the main object of the book was the development of equations and methods that could be used by any individual in developing his own study. The models were not intended to be comprehensive, considering in depth all the possible economic relationships between a college or a community. Nor were they intended to be sophisticated, complex, analytical tools; but they were rather designed for ease of use. The models were linear cash-flow formulas including only what could be readily accounted and added, omitting the qualitative issues. The models included only institutional expenditure and did not concern institutional revenue. They were also limited on a short term economic impact. The models were designed to produce conservative figures; that is, the actual economic impact is probably greater than what the models suggest.

In summary, the models were simple, credible devices for estimating cash flow, omitting the political, social, and esthetic impacts or the effect upon the community of the college human resources. They were flexible, comprehensive in measurement of dollar outlay, and provided simple indicators for planning. The models are based on the concept of the industrial multiplier that deals with the impact of the college or university as amplified in its influence on the community. A very large bibliography was included at the end of the ACE study.

The Economic Impact of Eastern Illinois University on Charleston, Illinois (Bryce, 1975) was undertaken to determine (1) the amount spent by individuals connected with the University, (2) how many additional dollars were generated in the local community by the University, (3) what impact University visitors had on the community, and (4) how much University staff and faculty added to the tax base of Charleston and the Unit

1 School District. The study further attempted to determine the increase in the bank-loan base caused by the influence of the University.

Questionnaires were mailed, along with a letter from the President of the University, to all the faculty, administrators, civil service employees, and a random sample of 20 percent of the students. Included in the questionnaire were questions about visitors. Local motel owners were interviewed to determine the number of times the motel was used by persons visiting the University or visiting individuals connected with the University. The data collected from the Charleston area was then used with the ACE models to determine the impact of the University on the local area. Since the multiplier effects are difficult to trace directly, and can only be estimated, this study chose a very conservative figure--1.75. It was estimated that the University had an impact on the local Charleston Community of more than $28 million.

The Economic Impact of St. Cloud State University was undertaken by Gerald K. Gamber (1976). The purpose of this study, a revision of an earlier study dated 1972, was to determine the economic impact of the University on the St. Cloud community and, if possible, the amount of money that the city received in lieu of tax that would have been collected had the University not owned the property. Listed in the study were several formulas used in the calculations. These formulas were taken from the book published by the American Council on Education (Caffrey & Isaacs, 1971). Four models--business, government, individual, and recapitulation of expenditures--were included in the study. Gamber stated that the monies accrued indirectly to the local government from taxes far exceeded the money that the local government would have collected had the University not been in the community. Also included in

the study were a very detailed explanation of how the University-owned lands were obtained and a copy of the questionnaire used in the study.

The University Spending Impact: Fort Wayne (Shipchandler and Sunday, 1977), published in the Indiana Business Review was undertaken to estimate the influence of the University on Allen County during the 1975-1976 period. An attempt was made in this study to measure the magnitude of the added income and employment enjoyed in the Allen County as a result of the expenditure of the University staff, its students, and other patrons. The study did not attempt to include the major building programs but did take into account that many of those employed by the University had spouses who worked elsewhere. A questionnaire was mailed to a selected group of faculty and students. The response rate from the sample of students was barely acceptable. Some unusually large dollar amounts reported by the students caused that part of the study to be suspect. Hence, some of the inputs were based as much on judgement as on actual data provided by the students. The impact of the University on Allen County recorded by the study was an increase in employment of over 3,400 and an increase in the economy of more than $19 million.

The Economic Impact of Shippensburg State College on the Local Community was undertaken by Micklosen and Smith (1975). Its purpose was to determine the economic impact of Shippensburg State College on (1) local business, (2) local government, and (3) the individuals themselves. Included in the study was a map of the local area on which two circles had been drawn. The respondants were asked to disclose their actual spending in these geographical areas. This short study included only the results of the ACE guidelines models. Also included were copies of the questionnaires with the number of responses received for each question.

The Economic Impact of a Small College (Weiss, 1966), was undertaken to examine the impact of Husson College, a private, non-profit institution, in terms of expenditures in the Greator Bangor area and to measure the extent to which the college expenditures represent export-income; that is, spending that stems from sources outside the area. This study antidates the ACE publication on this subject, and the author found only four other studies which had been published at that time. The Husson study measured only the gross economic impact and did not include social or cultural benefits to the community. No attempt was made to measure the cost of community services--sewer, police, and fire protection--provided to Husson College. Questionnaires were sent to the College staff, faculty, and selected students to determine their effective spending. Forty-three percent of the staff and faculty and twenty-one percent of the students' responses were useable. Four categories were studied: (1) operating expenses, excluding payroll, (2) capital investments, (3) employee expenditure, and (4) student supplementary expenditure.

It was concluded that since the economic growth of a local economy is dependent on its export industries, and since an institution of higher education is definitely an important source of export income for an urban community, and because 65 percent of the College services were used and paid for by students whose regular residence was outside the local area, a small college such as Husson College can be a major export-income source in the local community.

The Community Impact of the University of California at Berkeley and Santa Cruz was a staff report prepared by Irons, Stefan, and Fink (1967). The objectives of the study were (1) to provide specific infor-

mation about the economic impact of the campus on the community, (2) to provide a forecast for retailing and service activities, (3) to assist the University in its discussion with the leadership of local communities, and (4) to enable University planners to better modify the physical structure of the existing campus to improve the University's impact and relationship with the local community. Survey questionnaires, designed to measure personal consumption and expenditures, were mailed to selected students, faculty, and staff at Berkeley and Santa Cruz. Four basic areas were considered: (1) expenditures on an annual basis, (2) expenditures at the beginning of each academic term, (3) monthly expenditures, and (4) weekly expenditures. These expenditures were divided into four geographical areas in Berkeley and two areas in Santa Cruz. A statistical analysis of the faculty spending in the Berkeley area was carried out to determine the specific variety of consumer products most often purchased by University-based employees.

The Ball State University study entitled, Cost and Benefits of Ball State University to Metropolitan Muncie by John Hannaford in collaboration with some of his Urban Studies students, was published in 1971. The aim of this study was to determine the difference the University made (1) to the cost and revenues of the local government, (2) to local employment, and (3) to the growth of local business. The costs were listed in three categories: (1) physical services, (2) added cost of public schools, and (3) loss in property tax revenue. In determining the estimated loss in tax revenue, two factors were considered: (1) what would the city be like if the University was not there and (2) since this was originally agricultural land, what would be the tax revenue from 720 acres of agricultural land. The study dealt in depth with the loss and gain in taxes

to the local community. The final result of the inquiry showed a net positive source of revenue for the city of Muncie of almost $20 for every student enrolled. For every 1,000 students enrolled, Ball State's influence created about 413 extra full-time jobs for the local community and added about $101,000 to the local economy.

The Impact of Private Colleges and Universities on the Economy of the State of Missouri by Bruce W. Macy and Robert Gustafson (1968) was undertaken for the Missouri Commission of Higher Education. Since approximately half of the students of private colleges and universities in the state of Missouri are legal residents of other states, the study attempted to explore the role of this outside influence on the economy of the state of Missouri. Primary data for the analysis of the student expenditures were obtained with the assistance and cooperation of the Missouri Commission of Higher Education and officials of the colleges through a survey of students attending private institutions whose legal residence was outside the state. The sample comprised 2 percent of all out-of-state students. The average spending of the 2 percent sample amounted to approximately $3,400. The private colleges and universities of the state of Missouri had a multiplier of 2.9, which increased the level of the local community economy by $9,860 per student. Other than the economic impact of these private institutions, the study mentioned several intangible but unmeasurable impacts. The presence of a college can serve as a stimulus to the community, its surrounding regions, and the state. It makes the local area more attractive to young businessmen because it provides lectures, recitals, theatrical productions, exhibits, atheletic events, entertainment, and other college or university sponsored events that local citizens can attend.

From this review of the literature it may be noted that the science of economic impact studies has been fairly well established. The authors considered the American Council of Education models (Caffrey & Isaacs, 1971) and the Economic Impact of St. Cloud State University (Gamber, 1976) as the most useful patterns for the present study.

CHAPTER III

METHODOLOGY

This study attempted to define answers to the following four questions:

1. To what extent is the University an economic asset in the area?
2. How widely does its economic influence extend?
3. To what extent is it an economic liability?
4. Do the benefits that accrue to the area from having the University located where it is outweigh the disadvantages, and, if so, by how much?

The American Council of Education publication (Caffrey & Isaacs, 1971) and the St. Cloud State University study (Gamber, 1976) were used as guidelines. These were adapted to the particular needs of Andrews University. In an attempt to obtain original data, questionnaires were prepared and given to the following groups: (1) all faculty, staff, and administrators, (2) students, and (3) a selected number of business establishments.

The questionnaire was developed using the ACE publication and the St. Cloud study as guides. It was then field tested and modifications were incorporated as indicated by the test sample.

The faculty and staff questionnaires were sent through the campus mail. Approximately 50 percent were returned from the first mailing. The second and third mailings increased the total, and to further increase the response rate, the non-respondants were then visited personally and

asked to respond. Though there were still some who refused to respond to the questionnaire, the final response rate for faculty and staff was 90 percent.

The dormitory students questionnaires were distributed to the respective deans and the students were called to the desk to complete the questionnaires. Of the dormitory students sampled, 100 percent responded.

The village students' questionnaires were mailed out with a self-addressed, stamped return envelope. Two mailings were used and those failing to respond after the second mailing were telephoned and asked to respond. The final over-all student response rate was greater than 90 percent.

University records were examined to obtain the needed data as outlined in appendix A. Further data were collected from the Oronoko Township office, the tax assessor's office, the school district superintendent's office, the Federal Reserve Board, the local planning commission and the county courthouse.

After the data had been collected it was applied to the modified models to determine the impact of Andrews University on the local community.

Justification of the Models

With few exceptions studies undertaken since 1971 have followed the guidelines set forth in Estimating the Impact of a College or University on the Local Economy (Caffrey and Isaacs, 1971) published by the American Council on Education. Because of this usage, this publication was considered a useful general model for the present study. Certain minor changes were related to the uniqueness of Andrews University: (1) church relation, (2) large number of industries, and (3) the Seminary and the University Schools.

These adjustments were not any more extensive than the changes made by other users of the ACE models. Using an established and published method gives credence to the approach since it has withstood the rigors of criticism from the profession and it allows comparisons with previous studies having used the same method.

CHAPTER IV

THE CHOICE OF THE MULTIPLIERS

The employment multiplier effect, a term used to indicate the number of added jobs that one job in an industry produces, is based on the assumption that an export industry, one that exports goods in exchange for money which is then spent in the local area, will increase the number of jobs in the local area by a coefficient. For example, 100 jobs in an industry might increase the local job market in the service area by 50 giving a total of 150 jobs. The employment multiplier would be equal to 150/100 or 1.5.

The service area would include all service businesses in the area such as: medical, municipal, educational, and retail service. Another multiplier effect that has been formulated is the economic multiplier--for every dollar spent, another fraction of a dollar will be generated in the local economy.

The most valid of these two multiplier effects according to Weiss and Goodwin (1966) is the employment multiplier effect. It is not only the most valid, it is also the easiest to estimate because employment figures are readily available whereas the actual dollar values needed to calculate the economic multiplier effect may be difficult to obtain.

There are several things that must be taken into consideration when studying the employment multiplier effect:

1. The level of service employment can vary independently in any of the export jobs. For certain types of export jobs a greater service employment will result. A community may also have an underdeveloped service sector which will cause an unusually high ratio of export to service employment.

2. The employment multiplier does not take into effect the imports--goods brought in by the community which might have been produced in the local environment. Some researchers feel that this tends to cancel the export multiplier effect, but Weiss and Goodwin (1966) argued that, in reality, imports do not hurt the employment multiplier effect as the estimates used in determining the effect are based, not on predicted levels, but on historic data.

3. Another problem encountered when using or studying the employment multiplier effect is the over emphasis placed on the export base with a tendency to neglect service activities. In reality, the export industry may have required a sound service base for its initial development.

4. It must be remembered that the employment multiplier effect fails to take into account changes in productivity and industrial wage differentials. As its estimates are taken from historic data, the results may not be valid when applied to the present, or when used to project the future.

There are several things that can hamper the effectiveness of the employment multiplier as a means of predicting the impact of an industry on the local community. As the formulation of an employment multiplier for a given locality depends largely upon the ratio of export to import, if there is very little industry in the local area, the

multiplier will be small. A military base can also lower the multiplier. In fact, around military bases the multiplier drops drastically to about 1.2 - 1.4. The reason for this drop is that military bases have their own stores and services on the base which are generally cheaper than those off the base and therefore are used by the base personnel.

The multiplier increases with the size of area as a larger area tends to have more industry and can also eliminate the effect of a military base by including data from other industry and community concentrations where the multiplier effect is much higher. It is interesting to note that whereas individual states have a varying multiplier effect figure of 2.5 - 3.0, and counties tend to have a variation between 2.2 - 2.5, those states which are heavily dependent upon military bases, such as Hawaii, have a multiplier effect of 1.2 or 1.3, considerably lower than the accepted norm.

There are two factors to be considered in choosing a multiplier effect figure for this study: (1) the area under consideration--a radius of 40 miles--is relatively small; and (2) the area is basically rural. A study of the following multiplier estimates would indicate that, based on the size of the area, a larger multiplier effect, such as 2.0, should be chosen; but since the area is basically rural, the multiplier must be smaller. Therefore, a more conservative figure was chosen.

1. Individual states (income units)--2.5-3.0 (average)
2. Lancaster County, Nebraska--2.3
3. Los Angeles County, California--2.2
4. Wichita, Kansas--2.0
5. Portsmouth-Dover area, New Hampshire (multiplier based on Pease Air Force Base expenditures only)--1.2-1.4
6. Hawaii--1.3
7. Ayer, Massachusetts (small town, semirural, large military installation)--1.2 (Caffrey & Isaacs, 1971, p. 44).

The first multiplier (m_p) used in the model B-1.2 indicates the additional value of local production generated by one dollar spent by local households in the local businesses and the amount purchased by local businesses from other local businesses. As most local businesses purchase from outside Area A the conservative figure of 0.16 was chosen for this study. The ACE models recommend a range of 0.15 to 0.30 (p. 45).

The income induced multiplier (m_i) used in model B-1.3 represents the receipts from individual household spendings that create in the local industry a large commercial output when this income is recycled. Since there is a low industry/agriculture ratio in the local area, a conservative figure of 0.6 was chosen. This figure is the lowest figure recommended by the ACE models, the range being from 0.6 to 0.8.

Andrews University is the main employer in the township area as there is comparatively little industry in comparison to the amount of agriculture in the 40 mile radius. This low industry level indicates the choice of a very conservative employment multiplier figure of 1.76 as compared to the listed county norm of ranging from 1.75 to 2.1.

In the 200 mile area the multiplier effect figures listed in the ACE models were used unchanged except for the m_p and the m_i figures. The figures that were chosen were chosen to obtain a multiplier effect that would be slightly higher than the state normal minimum of 2.5. It was felt that since the area is very industrialized, its imports would be correspondingly fewer, indicating the choice of a figure close to the maximum of .30 suggested by Caffrey and Isaacs (1971). The figures chosen (m_p = .28 and m_i = 1.3) added together plus 1 equals the desired approximate state figure of 2.5.

The multiplier effect figures used in the study are quite arbitrary as no studies have been undertaken previously in the local area to develop accurate local multiplier effect figures. Because of this, it was decided that the utilization of conservative figures would present the most valid results.

CHAPTER V

STUDY RESULTS

Determining the actual amount that the University spent in the local area represented a considerable challenge. The method used for this determination involved the division of the expenditures of the University into three basic area categories: within a radius of 40 miles (Area A); outside the radius of 40 miles but inside the radius of 200 miles (Area B); and beyond the radius of 200 miles. Percentages were calculated only on the expenditures incurred in the first two areas, ignoring those incurred in the area outside the 200 mile radius because the multiplier effect for the amount of business expansion is not valid over an infinitely large area.

University-Related Local Expenditures

The sum of the expenditures by the University, faculty and staff, students, and visitors is recorded in the following table. These figures and the multipliers of models B-1.2 and 1.3 show the direct and continuing impact of the University on the local economy. Since this is a continuing process, its measurement is of short-term value due to the continuous changing of the impact. If any long-term assumptions are to be made, based on this data, it must be realized that the accuracy would be subject to question if the local economic conditions had changed.

Table I is a summation of tables II, III, VII, and XIII. The total, $11,408,781, represents all the actual expenditures incurred in Area A due to the presence of the University and its personnel.

TABLE I

Model B-1.1

$(E_L)_{CR}$

University-Related Local Expenditures

	A	B
$(E_L)_{CR} = (E_L)_C + (E_L)_F + (E_L)_S + (E_L)_V$	$11,408,781	$ 6,169,839
$(E_L)_C$ Local expenditures by the University (Model B-1.1.1)	3,382,397	5,685,029
$(E_L)_F$ Local expenditures by faculty and staff (Model B-1.1.2)	2,867,034	289,250
$(E_L)_S$ Local expenditures by students (Model B-1.1.3)	4,917,813	195,560
$(E_L)_V$ Local expenditures by visitors to the University (Model B-1.1.4)	241,537	

Direct University expenditures

Table II shows the formula used in the calculation of the expenditures of the University in the local area. Gross compensation paid to faculty, staff, and students along with any taxes paid by the University was subtracted from the total University expenditure and then multiplied by the proportion spent in each particular area giving Area A a total of $3,383,397 and Area B a total of $5,685,029. To obtain the proportion the payables for the fiscal year 1976 - 1977 in the University records were examined and classified into the three areas: 26 percent were in Area A and 43.7 percent were in Area B.

TABLE II

Model B-1.1.1

$(E_L)_C$

Local Expenditures by the University

		A	B
$(E_L)_C = (e_L)_C (E_C - W_{F,S} - XF_C - R_C)$		$ 3,382,397	$ 5,685,029
$(e_L)_C$	Proportion of total University expenditures that are local, excluding compensation, internal items, and taxes	.26	.437
E_C	Total University expenditures	$22,604,747	
$W_{F,S}$	Gross compensation to faculty, staff, and students	9,508,140	
XF_C	Internal account transfers and payments	-0-	
R_C	Taxes and other payments to governments	$ 87,386	

Faculty and staff expenditures

Faculty and staff expenditures were divided into three basic categories: local rental housing expenditures (table IV); local non-housing expenditures (table V); local expenditures by non-local faculty and staff (table VI). The total expenditures of the faculty and staff in the local area are detailed in table III. The figure used for local rent by faculty and staff in table III should not be confused with the housing expense for faculty and staff homes (table XXVI) which applies to home owners not renters.

An examination of the University records revealed that the total disposable income of the faculty and staff amounted to $3,367,645. The survey indicated that approximately 150 families other than the 818 faculty and staff families moved into the local area to enable their

TABLE III

Model B-1.1.2

$(E_L)_F$

Local Expenditures by Faculty and Staff

	A	B
$(E_L)_F = (E_H)_F + (E_{NH})_F + (E_L)_{NLF}$	$ 2,867,034	$ 289,250
$(E_H)_F$ Expenditures by faculty and staff for local rental housing (Model B-1.1.2.1)	103,844	
$(E_{NH})_F$ Local non-housing expenditures by local faculty and staff (Model B-1.1.2.2)	2,744,294	289,250
$(E_L)_{NLF}$ Local expenditures by non-local faculty and staff (Model B-1.1.2.3)	18,896	

children to obtain a Christian education. The figure 150 was determined in two steps: 1. The number of village students polled in the survey that indicated they were living with parents who had moved into Berrien County so they could attend Andrews University (4) was divided by the number of village students polled (36) then that ratio was multiplied by the total number of village students (1,087) giving approximately 145. 2. The number of faculty and staff who indicated that their families had originally moved here so they could go to Andrews University (1) was divided by the total faculty and staff polled (85) and the resulting ratio was multiplied by the total faculty and staff (818) giving approximately 10. As the researchers felt that this figure was too large, a more conservative figure of 5 was chosen. This figure (5), when added to the previous 145 from the village students equals 150.

TABLE IV

Model B-1.1.2.1

$(E_H)_F$

Expenditures by Faculty and Staff for Local Rental Housing

$(E_H)_F = (f_L)\ (f_H)\ (DI_F)\ (e_H)$		$ 103,844
f_L	Proportion of faculty and staff residing locally	.958
f_H	Proportion of local faculty and staff who rent housing	.160
DI_F	Total disposable income of faculty and staff	$3,985,184
e_H	Proportion of a tenant's total expenditures likely to be spent for rental housing	.170

To make allowance for these families who are residing here solely because of the University, the figure of 150 was added to the 818 faculty and staff families which equals 968; and the total disposable income of faculty and staff was then multiplied by 968/818 giving a figure of $3,985,184 as recorded in table IV. Even with this expanded disposable income figure, total rental expenditures by faculty and staff in the local area was equal to only $103,844.

Table V showed that nearly 94 percent of the total non-housing expenditures of each survey participant was spent within a 40 mile radius of the University. The figure .766--the proportion of a consumer's total expenditures spent on non-housing items--was obtained by deducting the proportion of a tenant's total expenditures likely to be spent for rental housing (.17) and the allowance recommended by the ACE model to cover non-expenses or savings, etc. (.064) from 1.0. When 94 percent was multiplied by the proportion of the faculty and staff residing locally, by

their disposable income, and by the proportion of a consumer's total expenditures spent on non-housing items, the total local non-housing expenditures of local faculty and staff was found to be $2,744,294 in Area A and $289,250 in Area B.

TABLE V

Model B-1.1.2.2

$(E_{NH})_F$

Local Non-Housing Expenditures by Local Faculty and Staff

	A	B
$(E_{NH})_F = (f_L)\ (e_L)\ (DI_F)\ (e_{NH})_F$	$ 2,744,294	$ 289,250
f_L Proportion of faculty and staff residing locally	.958	
e_L Proportion of total non-housing expenditures that an individual is likely to make in his local environment	.9384	.0989
DI_F Total disposable income of faculty and staff	$ 3,985,184	
$(e_{NH})_F$ Proportion of a consumer's total expenditures spent on non-housing items	.766	

The local expenditures by non-local faculty and staff was obtained by subtracting the proportion of faculty and staff residing locally (.958) from 1.0 and then multiplying the result (.042) by the total number of faculty and staff (818) and multiplying that figure by the estimated average local expenditures of each non-local faculty and staff person ($550). The figure $550--used for the estimated average local expenditures by each non-local faculty and staff person--is $50 higher than that suggested in the ACE model because it was felt that a

certain consideration must be made for inflation since 1971, the year the ACE model was published.

TABLE VI

Model B-1.1.2.3

$(E_L)_{NLF}$

Local Expenditures by Non-Local Faculty and Staff

$(E_L)_{NLF} = (1 - f_L)\ (F)\ (E_1)_F$		$ 18,896
f_L	Proportion of faculty and staff residing locally	.958
F	Total number of faculty and staff	818
$(E_1)_F$	Estimated average local expenditures by each non-local faculty and staff person	$ 550

Student expenditures

Student expenditures have been divided into five possible areas: 1) non-married, living with parents or in dormitory--living expense, 2) married student renting expense, 3) married student non-housing expense, 4) local expense of non-local students, and 5) expenses by local fraternities. Each of these areas is dealt with separately in tables VIII - XII. All student expenditures are summed up in table VII.

Table VIII deals with the miscellaneous expenditures, exclusive of room and board, by students obtaining local room and board, for the purposes of this study, in the dormitories or with parents. This model does not include married students and single graduate and undergraduate students who are allowed to live off campus. The University records show that as of June, 1977, there were 1,518 non-married students living on or off campus, either in group arrangements or with parents.

TABLE VII

Model B-1.1.3

$(E_L)_S$

Local Expenditures by Students

	A	B
$(E_L)_S = (E_M)_S + (E_H)_S + (E_{NH})_S + (E_L)_{NLS} + (E_{LG})_S$	$ 4,917,813	$ 195,560
$(E_M)_S$ Local miscellaneous expenditures by students obtaining local room and board from dormitories, fraternities, sororities, other groups, or parents (Model B-1.1.3.1)	341,919	
$(E_H)_S$ Expenditures by students for local rental housing (Model B-1.1.3.2)	1,596,444	
$(E_{NH})_S$ Local non-housing expenditures by students who rent local housing (Model B-1.1.3.3)	2,957,850	195,560
$(E_L)_{NLS}$ Local expenditures by non-local students (Model B-1.1.3.4)	21,600	
$(E_{LG})_S$ Local expenditures by local fraternities, sororities, and other student living groups (Model B-1.1.3.5)	-0-	

It is estimated that these 1,518 students spend approximately $300 per student per year, this figure being the result of findings taken not only from the primary survey, but also from a smaller, more limited sampling conducted among these students. These students indicated that they spent approximately three-fourths of this amount in the local area.

Table IX shows local rental expenditures by married, graduate, and under-graduate students permitted to live outside the dormitories in locally rented housing. It was assumed that these students stay for at least one year and therefore, pay rent for twelve months. The mean figure (rent per month per student) was $173.

TABLE VIII

Model B-1.1.3.1

$(E_M)_S$

Local Miscellaneous Expenditures, Exclusive of Room and Board, by Students Obtaining Local Room and Board in Group Arrangements or with Parents

$(E_M)_S = (S_L)\ (E_m)_S\ (e_L)$		$ 341,919
S_L	Number of students obtaining local room and board from dormitories, fraternities, sororities, other groups, or parents	1,518
$(E_m)_S$	Average miscellaneous expenditures, exclusive of room and board, per student of this type	$ 300
e_L	Proportion of total expenditures, exclusive of room and board, that a student is likely to make in his local environment	.75

TABLE IX

Model B-1.1.3.2

$(E_H)_S$

Expenditures by Students for Local Rental Housing

$(E_H)_S = (S_H)\ (E_h)_S$		$1,596,444
S_H	Number of students renting local housing	769
$(E_h)_S$	Average rental housing expenditures per student	$ 2,076

Table X shows the local non-housing expenditures of 769 undergraduate and graduate students not living with parents or in the dormitories and married students. After subtracting tithe, tuition, tax, housing expense and savings, the average non-housing expense per student

was $3990. It was interesting to note that students in this category, residing locally, spent the greater share of their disposable non-housing income in the local area.

TABLE X

Model B-1.1.3.3

$(E_{NH})_S$

Local Non-Housing Expenditures by Students Who Rent Local Housing

	A	B
$(E_{NH})_S = (S_H)\ (E_{nh})_S\ (e_L)$	$ 2,957,850	$ 195,560
S_H Number of students renting local housing	769	
$(E_{nh})_S$ Average non-housing expenditures per student	$ 3,990	
e_L Proportion of total non-housing expenditures that a student is likely to make in his local environment	.964	.0637

Table XI deals only with expenditures in the local area by non-local students. It was assumed that there were approximately 30 students who live outside the 40 mile area. A conservative figure of $60 per month was spent in the local area by these students for gas, travel, etc.

TABLE XI

Model B-1.1.3.4

$(E_L)_{NLS}$

Local Expenditures by Non-Local Students

$(E_L)_{NLS} = (S_{NL})\ (E_1)_S$	$ 21,600
S_{NL} Number of non-local students	30
$(E_1)_S$ Estimated average local expenditures by each non-local student	$ 720

TABLE XII

Model B-1.1.3.5

Local Expenditures by Local Fraternities, Sororities, and Other Student Living Groups

Not applicable in this study. $0.00

Table XII does not apply to Andrews University because there are no fraternities or sororities connected with the campus. Either students live in the village or in campus dormitories and dormitory expenses are handled through the University expenditures.

Visitor-related expenditures

On the questionnaire used in the survey, each respondant was asked to estimate how much his visitors spent in the local area during the year 1977. The mean of each polled group (faculty and staff, dormitory students, and village students) was multiplied by the total number

TABLE XIII

Model B-1.1.4

$(E_L)_V$

Local Expenditures by Visitors to the University

From Survey:

Village students	1087 x $ 79.46	=	$ 86,373
Dorm Students	1255 x 48.00	=	60,240
Faculty	275 x 133.55	=	36,726
Staff	543 x 87.02	=	47,252
	3160		$230,591

$$\frac{3160 + 150}{3160} \times 230,591 = \$241,537$$

of individuals in the four different groups (3,160). The sum ($230,591) was then increased to make allowances for the 150 families that have been estimated to have moved into the area to educate their children by taking the total number in all groups (3,160) and adding the 150, dividing this by the 3,160 and multiplying that figure by $230,591. The result was $241,537. This figure represents the amount of business brought into the area by visitors of those either attending or working at the University.

Multiplier effect

Table XIV and XV are the multiplier effect models. The total University-related local expenditures ($11,408,781) found in table I form the basis of the calculations in table XIV. This figure was multiplied by 0.16 (table XIV) to determine the amount of purchases from local sources by other local businesses.

TABLE XIV

Model B-1.2

$(P_{LB})_{CR}$

Purchases from Local Sources by Local Businesses in Support of Their University-Related Business Volume

	A	B
$(P_{LB})_{CR} = (m_p)\ (E_L)_{CR}$	$ 1,825,405	$ 1,727,555
m_p Coefficient representing the degree to which local businesses purchase goods and services from local sources	.16	.28
$(E_L)_{CR}$ University-related local expenditures (Model B-1.1)	$11,408,781	$ 6,169,839

In table XV, 0.6, the coefficient representing the degree to which individual income received from local business activity was spent and respent locally was multiplied by the University-related local expenditures (table I) to determine the local business volume stimulated by the expenditure of University-related income by local individuals other than faculty, staff, or students. The coefficient figures used in tables XIV and XV are both conservative figures taken from those recommended by Caffrey and Isaacs in their ACE model (1971, pp. 45 and 71).

TABLE XV

Model B-1.3

$(BV_I)_{CR}$

Local Business Volume Stimulated by the Expenditure of University-Related Income by Local Individuals Other than Faculty, Staff, or Students

	A	B
$(BV_I)_{CR} = (m_i)\ (E_L)_{CR}$	$ 6,845,268	$ 8,020,791
m_i Coefficient representing the degree to which individual income received from local business activity is spent and respent locally	.6	1.3
$(E_L)_{CR}$ University-related local expenditures (Model B-1.1)	$11,408,781	$ 6,169,839

University-Related Local Business Volume

A summation of the information of tables I, XIV, and XV is recorded in table XVI. This figure ($20,079,454) represents the annual or continual impact of Andrews University on the local economy. These figures are very conservative due to the conservative multipliers used in models B-1.2 and B-1.3.

TABLE XVI

Model B-1

BV_{CR}

University-Related Local Business Volume

	A	B
$BV_{CR} = (E_L)_{CR} + (P_{LB})_{CR} + (BV_I)_{CR}$	$20,079,454	$15,918,185
$(E_L)_{CR}$ University-related local expenditures (Model B-1.1)	11,408,781	6,169,839
$(P_{LB})_{CR}$ Purchases from local sources by local businesses in support of their University-related business volume (Model B-1.2)	1,825,405	1,727,555
$(BV_I)_{CR}$ Local business volume stimulated by the expenditure of University-related income by local individuals other than faculty, staff, or students (Model B-1.3)	6,845,268	8,020,791

Value of Local Business Property Committed To University-Related Business

The next four tables are a compilation of the information pertaining to the value of local business property, both in real estate and inventory, that can be traced to the University for its existence. The calculations for this information were divided into three areas: the value of local business real property committed to University-related business, the value of local business inventory committed to University-related business, and the value of local business property, other than real property and inventory, committed to University-related business. Each of these areas is dealt with separately in tables XVIII, XIX, and XX. The information recorded in these tables is compiled in table XVII and shows that $22,887,070 of the local business property is committed to University related business in Area A, and $18,151,950 in Area B.

TABLE XVII

Model B-2

$(PR_B)_{CR}$

Value of Local Business Property Committed to University-Related Business

	A	B
$(PR_B)_{CR} = (RP_B)_{CR} + (I_B)_{CR} + (OP_B)_{CR}$	$22,887,070	$18,151,950
$(RP_B)_{CR}$ Value of local business real property committed to University-related business (Model B-2.1)	15,613,698	12,377,912
$(I_B)_{CR}$ Value of local business inventory committed to University-related business (Model B-2.2)	2,409,534	1,918,182
$(OP_B)_{CR}$ Value of local business property, other than real property and inventory, committed to University-related business (Model B-2.3)	4,863,838	3,855,856

Table XVIII calculates the amount of local business real property committed to University-related businesses. Figures for this table were drawn from table XIV and from government tax records. As the actual

TABLE XVIII

Model B-2.1

$(RP_B)_{CR}$

Value of Local Business Real Property Committed to University-Related Business

	A	B
$(RP_B)_{CR} = \frac{BV_{CR}}{BV_L} \quad \frac{V_B}{amv}$	$15,613,698	$12,377,912
BV_{CR} University-related local business volume (Model B-1)	20,079,454	15,918,185
BV_L Local Business Volume	36,742,000	
V_B Assessed valuation of local business real property	14,285,211	
amv Local ratio of assessed value to market value of taxable real property	0.5	

dollar value of capital facilities in a business community is not usually obtainable, an assessed value of the local business real property was used. The ratio used in this table was calculated by dividing the university-related local business volume by the local business volume.

TABLE XIX

Model B-2.2

$(I_B)_{CR}$

Value of Local Business Inventory Committed to University-related Business

	A	B
$(I_B)_{CR} = (ibv)\ (BV_{CR})$	$ 2,409,534	$ 1,910,182
ibv Inventory-to-business volume ratio	0.12	
BV_{CR} University-related local business volume (Model B-1)	$20,079,454	$15,918,185

The figures used in table XIX to calculate the value of local business inventory committed to University-related business was from table XVI and the ACE model. The figure .12 was taken from the Internal Revenue Service's Statistics of Income, 1965: Business Income Tax Returns (1968) which used corporations in its calculations. Caffrey and Isaacs (1971) felt, though, that these figures need not be significantly altered when applied to educational institutions.

The computation of the figures in table XX presented some real challenging problems to the auditor. A number of local businesses were surveyed and the variance in the equipment inventories proved to be rather broad. It was estimated that the average equipment inventory in business in the local area was approximately $50,000. This figure in-

cluded the value of shelves, cash registers, and other items that would be connected with running the businesses and also, in industry, tools and machines. If the model recommended by Caffrey and Isaacs were followed exactly as given in the ACE model, the result would be a ratio, not a dollar figure. To obtain a dollar figure, the model was modified to accept this preference by multiplying the ratio (.24223) achieved through the formula by the University-related local business volume, ($20,079,454) calculated in table XVI. The resulting dollar figure can easily be compared with other dollar figures used in the study.

TABLE XX

Model B-2.3

$(OP_B)_{CR}$

Value of Local Business Property, Other than Real Property and Inventory, Committed to University-Related Business

		A	B
$(OP_B)_{CR} = \frac{BV_n\ (OP_n)}{BV_L}\ (BV_{CR})$		$ 4,863,838	$ 3,855,856
OP_n	Value of local business property, other than real property and inventory, of the n^{th} enterprise	50,000	
BV_n	Number of local businesses	178	
BV_L	Local Business Volume	$36,742,000	
BV_{CR}	University-related local business volume (Model B-1)	20,107,631	$15,981,185

Expansion of the Local Banks' Credit Base Resulting from University-Related Deposits

Another area of University influence in the local area was seen in the effect that the faculty, staff, student, and University deposits have on the local banks' credit base. It would be assumed that the addition

of such a large community would increase the patronage of the local banks. This assumption was proved correct. The estimated expansion of the credit base of banks in Area A was $5,722,387, considerably higher than that in Area B. It was interesting to note, though, that this expansion was due largely to the contribution of the faculty, staff, and students. The University operates on a low time-deposit and demand-deposit level and retains the policy that a larger percentage of its time-deposit funds be placed in Area B banks rather than in Area A banks. The cash-to-

TABLE XXI

Model B-3

CB

Expansion of the Local Banks' Credit Base Resulting from University-Related Deposits

	A	B
$CB = (1-t)\,[TD + TD_f] + (1-d)\,[DD_c + DD_f + (cbv)\,(BV_{CR})]$	$ 5,722,387	$ 986,269
t Local time-deposit reserve requirement	0.03	
TD_c Average time-deposit of the University in local banks	$ 411,666	$ 487,000
TD_f Average time-deposit of all the faculty, staff, and students in local banks	4,010,592	
d Local demand-deposit reserve requirement	0.1275	
DD_c Average demand-deposit of the University in local banks	$ 420,608	
DD_f Average demand-deposit of all the faculty, staff, and students in local banks	478,626	
cbv Cash-to-business-volume ratio	0.037	
BV_{CR} University-related local business volume (Model B-1)	$20,079,454	$15,918,839

business-volume ratio of 3.7 percent which represents the amount of cash that an industry must maintain to operate in relation to University-related business, suggested by Caffrey and Isaacs (1971), was taken from the Statistics of Income, 1965: Business Income Tax Returns (1968).

Local Business Volume Unrealized because of The Existence of University Enterprises

Not all financial impacts of the University are positive. Andrews University is unique as compared to other universities in that Andrews University, due to its philosophy of education that the physical, along with the mental and the spiritual aspects of man must be trained, operates a large number of industries. Certain of these industries, including a large department store with gross sales of over $3½ million, are in competition with local businesses. A resume of these industries and the volume of business lost to local industries and businesses because of the presence of these University-related industries is found in table XXII.

It must be understood that though local sales of these industries are high, most University-related industries also service an area beyond Area A. Because these industries do service a larger area and therefore do attract customers to the area, it is felt that their presence is a benefit, not a detriment in many ways.

Included in this table is the income to the University from campus provided housing. The University operates a number of efficiency-sized to three-bedroom apartments on the campus and a number of apartments and housing units in various places in the community. These apartments are rented at reasonable rates only to graduate and select undergraduate families. The rent received from these apartments was included in table XXII as it represented a competitive business venture.

Andrews University has a policy, based on its religious background and operation, of requiring all, or as many as possible, single students on the undergraduate level to live in the dormitories where a religious atmosphere is provided. As the regular board and room fees paid by all dormitory students do not represent any type of competitive activity by the University, they were not included in the computation of this table. If the University had a policy that would allow students to live off-campus if they wished, the room and board fee charged for dormitory residence would be in competition with local rental housing.

TABLE XXII

Model B-4

$(BV_U)_C$

Local Business Volume Unrealized because of the Existence of University Enterprises

	A	B
Industries within the 40 mile area		
College Wood Products	$ 368,106	
Medical Center	379,739	
Auxillary	52,574	
Campus Housing	694,719	
Laundry	68,556	
Apple Valley Market	3,525,275	$ 185,540
Cum Laude Motel	12,965	
Friendly Market	139,563	
Thomas Market	273,773	
Flower Loft	65,439	
Farm	110,093	
Dairy	435,595	
Value Mart	266,838	
Aviation	235,548	
TOTAL	$ 6,628,783	$ 185,540

University-Related Revenues Received By Local Governments

The group of ten tables, beginning with table XXIII and continuing to table XXXII details the amount of income received by the local governments, allocated to Andrews University. Local government tax records, the survey results, and previous tables have been tapped for the information needed to complete the computations outlined in these models. Because of the nature of the information being formulated, these models deal only with Area A.

A summation of all University-related revenues received by local governments is enumerated in table XXIII. The largest figure in the list of revenues received by the government was that of the real-estate

TABLE XXIII

Model G-1

R_{CR}

University-Related Revenues Received by Local Governments

$R_{CR} = (R_{RE})_{CR} + (R_{NRE})_{CR} + (R_{ST})_{CR} + (R_A)_{CR} + (R_Q)_{CR}$	$ 1,259,739
$(R_{RE})_{CR}$ University-related real-estate taxes paid to local governments (Model B-1.1)	1,188,472
$(R_{NRE})_{CR}$ University-related property taxes, other than real-estate, paid to local governments (Model G-1.2)	-0-
$(R_{ST})_{CR}$ Sales tax revenue received by local governments as a result of University-related local purchases (Model G-1.3)	36,206
$(R_A)_{CR}$ State aid to local governments allocable to the presence of the University (Model G-1.4)	35,061
$(R_Q)_{CR}$ Other University-related revenues collected by local governments (Model G-1,5)	-0-

taxes. This, of course, reflects the fact that a large proportion of the faculty and staff have purchased homes in the area and does not reflect taxes on the tax-free property owned by the educational institution.

University-related real-estate taxes

Tables XXV to XXVIII cover real-estate taxes with table XXIV showing the total University-related real-estate taxes paid to local governments.

TABLE XXIV

Model G-1.1

$(R_{RE})_{CR}$

University-Related Real-Estate Taxes Paid Local Governments

$(R_{RE})_{CR} = (R_{RE})_C + (R_{RE})_F + (R_{RE})_S + (R_{RE,B})_{CR}$		$ 1,188,472
$(R_{RE})_C$	Real-estate taxes paid to local governments	87,386
$(R_{RE})_F$	Real-estate taxes paid to local governments by local faculty and staff (Model G-1.1.2)	775,697
$(R_{RE})_S$	Real-estate taxes paid to local governments by local fraternities, sororities, and other student living groups (Model G-1.1.3)	-0-
$(R_{RE,B})_{CR}$	Real-estate taxes paid to local governments by local businesses for real property allocable to University-related business (Model G-1.1.4)	325,389

Table XXV shows the local real-estate taxes paid to the local government by the University during the fiscal year, 1977. This figure was obtained from the Annual Statement of the University for that year and represents the total real-estate taxes due for property owned by the

TABLE XXV

Model G-1.1.1

$(R_{RE})_C$

Real-Estate Taxes Paid to Local Governments by the University

$(R_{RE})_C$	$ 87,386

University but not used directly for educational purposes, including the property on which Apple Valley Market is situated.

Real-estate taxes paid to the local government by local faculty and staff for the year 1977 amounted to $775,697. The calculations required to produce this figure were rather involved. The expanded figure (to allow for the 150 families who moved here because of the University) was used in this formula. The average value of homes owned by University employed faculty and staff was $41,370, a figure that was taken from the

TABLE XXVI

Model G-1.1.2

$(R_{RE})_F$

Real-Estate Taxes Paid to Local Governments by Local Faculty and Staff

$$(R_{RE})_F = \left[(F_L)\ (1-f_H)\right] \left[pt\ \frac{V_{PR}}{N_{PR}}\right]$$ $ 775,697

F_L	Number of faculty and staff residing locally	927
f_H	Proportion of local faculty and staff who rent housing (See Model B-1.1.2.1)	0.159
pt	Local property tax rate	0.04168
$\frac{V_{PR}}{N_{PR}}$	Survey result giving an average assessed value	$ 23,872

survey results. The assessed value of these homes, the value used for tax purposes, was one-half that of the market value or $23,872, a figure that was slightly higher than the average value of homes in Berrien County. Table XXVI details the formula used in the computation of the real-estate taxes paid to local governments by local faculty and staff.

As the University does not operate any fraternities or sororities in the local community (the dormitories are all located on the 1,300 University owned acres) table XXVII was not pertinent to this study.

TABLE XXVII

Model G-1.1.3

$(R_{RE})_S$

Real-Estate Taxes Paid to Local Governments by Local Fraternities, Sororities, and Other Student Living Groups

Dormitories are not taxed	$0.00

Table XXVIII shows the real-estate taxes paid to local governments by local businesses for real-estate property which was supported by University-related businesses.

TABLE XXVIII

Model G-1.1.4

$(R_{RE,B})_{CR}$

Real-Estate Taxes Paid Local Governments by Local Businesses for Real Property Allocable to University-Related Business

$(R_{RE,B})_{CR} = (pt)\left(\frac{BV_{CR}}{BV_L} \times V_B\right)$		$ 325,389
pt	Local property tax rate (Model G-1.1.2)	0.04168
BV_{CR}	University-related local business volume	$20,079,454
BV_L	Local Business volume (Model B-2.1)	36,742,000
VB	Assessed valuation of local business real property (Model B-2.1)	14,285,211

University-related revenues

The following four tables (XXIX to XXXII) each deal with a different government tax or state aid that can be allocated to the presence of the University in Oronoko Township. For the purpose of the calculations in table XXIX the percentage of the collected sales tax retained by the County was used to apply to the whole 40 mile radius included in Area A.

TABLE XXIX

Model G-1.3

$(R_{ST})_{CR}$

Sales Tax Revenue Received by Local Governments as a Result of University-Related Local Purchases

$$(R_{ST})_{CR} = (st_{LG})\ (ST) \left(\frac{BV_{CR}}{BV_L}\right)$$ $ 36,206

st_{LG}	Propertion of sales tax retained by local governments	0.25
ST	Total sales tax collected locally	$ 265,000
BV_{CR}	University-related local business volume	20,079,454
BV_L	Local business volume	36,742,000

The results of this table show that the University is responsible for about $36 thousand of the total sales tax received by the local government.

Probably one of the most difficult figures to obtain in the whole study was the number of students from faculty, staff, and student families that attend the local public schools. As no concrete figures could be obtained, an estimated number of 50 was utilized for calculating

the State aid received by local public schools because of the attendance of University-related children. The Berrien Springs school district records an attendance of approximately 2,390 students. State aid influenced by these estimated 50 students was approximately $35,000. It should be pointed out that even though very few University-related children attend the Berrien Springs School District schools, this is not because of any lack in the quality of education on the part of these schools. Jon Schuster, the superintendent of Berrien Springs Public School District, has pointed out that if it were not for these University-related people who are supporting the local school district, it would be a much poorer school district. Traditionally, though, Adventist children have always been sent to Adventist-operated parochial schools of which there are many in Area A.

TABLE XXX

Model G-1.4.1

$(R_A)_{CH}$

State Aid to Local Public Schools Allocable to Children of University-Related Families

$$(R_A)_{CH} = A_{PS} \frac{(CH_{PS})_F + (CH_{PS})_S}{CH_{PS}}$$

		$ 35,061
A_{PS}	Total state aid to local public schools	1,675,894
$(CH_{PS})_F$	Number of faculty and staff children attending local public schools (Model G-2.2)	-0-
$(CH_{PS})_S$	Number of students' children attending local public schools (Model G-2.2)	50
CH_{PS}	Total number of children attending local public schools (Model G-2.2)	2,390

Table XXXI is another model that is not significant in this study as the only aid to the local government that is influenced by the presence of the University is that of the possible aid to the public schools due to the attendance of a small number of University-related children.

TABLE XXXI

Model G-1.4

$(R_A)_{CR}$

State Aid to Local Governments Allocable to the Presence of the University

$(R_A)_{CR} = (R_A)_{CH} + (R_A)_{PC}$	$35,061
$(R_A)_{CH}$ State aid to local public schools allocable to children of University-related families (Model G-1.4.1)	35,061
$(R_A)_{PC}$ Other state aid received by local governments on a per capita, service-unit, or tax-unit basis and influenced by the presence of the University, e.g., gasoline tax allocations, road maintenance subsidies (establish on the basis of local conditions.)	Not available

Table XXXII deals with five other areas of University-related revenues that are collected by the local government. For the purposes of this study these figures were either not ascertainable or not applicable. The auto registration fees are not collected by local governments but rather by state government. Utility, sewer, and sanitation facilities are all self-provided by the University and it proved impossible to calculate the amount paid for these facilities by the faculty, staff, and students living in the local community.

TABLE XXXII

Model G-1.5

$(R_Q)_{CR}$

Other University-Related Revenues Collected by Local Governments

These figures are either not available or are not applicable.

Operating Cost of Local Government-Provided Municipal and Public School Services Allocable To University-Related Influences

Tables XXXIII through XXXV estimate the cost of running the local government that can be allocated to the University and University-related personnel. These services would include such areas as municipal services and public schools. The final total spent by the government on University-influenced municipal services was $227,130 and is detailed in table XXXIII.

TABLE XXXIII

Model G-2

$(OC_{M,PS})_{CR}$

Operating Cost of Local Government-Provided Municipal and Public School Services Allocable to University-Related Influences

$(OC_{M,PS})_{CR} = (OC_M)_{CR} + (OC_{PS})_{CR}$	$227,130
$(OC_M)_{CR}$ Operating cost of local government-provided municipal services allocable to University-related influences (Model G-2.1)	136,864
$(OC_{PS})_{CR}$ Operating cost of local public schools allocable to University-related persons (Model G-2.2)	90,266

The total number of persons in local faculty and staff households was obtained by multiplying the mean (6.58) of the number of people in each household by 968, the total faculty and staff plus the allowance for the 150 extra families that have moved here because of the University. The total number of persons in local students households was obtained in the same manner, by multiplying the mean (1.98) of each household by 1,087, the total number of students. The total resident population was an estimate made by the school district. The result of this part of the research shows that a little less than half the local budget was spent in providing services for the University and University-related personnel. This figure is recorded in table XXXIV.

TABLE XXXIV

Model G-2.1

$(OC_M)_{CR}$

Operating Cost of Government-Provided Municipal Services Allocable to University-Related Influences

$$(OC_M)_{CR} = \left(\frac{\frac{F + S}{POP_{LD}} + \frac{FH_L + SH_L}{POP_{LR}}}{2} \right) \left(B_M \right)$$ $ 136,864

F	Total number of faculty and staff (Model B-3)	968
S	Total number of students (Model B-3)	2,342
POP_{LD}	Total local daytime population	14,720
FH_L	Total number of persons in local faculty and staff households	6,368
SH_L	Total number of persons in local student households	4,640
POP_{LR}	Total local resident population	16,000
B_M	Local governments' operating budgets for all municipal services except public schools	$ 299,855

The cost of running the local schools allocable to the University (table XXXV) was very small due to the small number of University-related students attending the public schools. The Berrien Springs Public School District records indicated a budget of $4,314,000 of which only approximately $90,000 was considered induced by University-related personnel. It was interesting to note that though personnel involved with the University pay their fair share of the taxes for the operation of the local public schools, very little of what they paid was used by them.

TABLE XXXV

Model G-2.2

$(OC_{PS})_{CR}$

Operating Cost of Local Public Schools Allocable to University-Related Persons

$$(OC_{PS})_{CR} = \left[\frac{(CH_{PS})_F + (CH_{PS})_S}{CH_{PS}}\right]\left(B_{PS}\right) \qquad \$ \quad 90,266$$

$(CH_{PS})_F$	Number of faculty and staff children attending local public schools (same as in Model G-1.4.1)	-0-
$(CH_{PS})_S$	Number of students' children attending local public schools (same as in Model G-1.4.1)	50
CH_{PS}	Total number of children attending local public schools (same as in Model G-1.4.1)	2,390
B_{PS}	Local governments' operating budgets for public schools	$ 4,314,710

Value of Local Governments' Properties Allocable to University-Related Portion of Services Provided

Table XXXVI determined the value of local government properties that was created because of the presence of the University. This figure indicates the permanent impact of the University on the local government.

Information for this table was gleaned from government records and previous tables. As the public school and the local government owned properties are not assessed for tax purposes, the value of this property had to be obtained from other records. The value of local government property was obtained by examining the insurance documents of the local government, and the value of the public school district property was obtained by examining the insurance documents for the school.

TABLE XXXVI

Model G-3

GP_{CR}

Value of Local Governments' Properties Allocable to University-Related Portion of Services Provided

$$GP_{CR} = \left[\frac{(OC_M)_{CR}}{B_M}\right]\left(GP_M\right) + \left[\frac{(OC_{PS})_{CR}}{B_{PS}}\right]\left(GP_{PS}\right)$$ $ 342,592

$(OC_M)_{CR}$ Operating cost of government-provided municipal services allocable to University-related influences (Model G-2.1)	138,864
B_M Local governments' operating budgets for all municipal services except public schools (same as in Model G-2.1)	299,855
GP_M Value of all local government property except public schools	410,000
$(OC_{PS})_{CR}$ Operating cost of local public schools allocable to University-related persons (Model G-2.2)	90,266
B_{PS} Local governments' operating budgets for public schools (same as in Model G-2.2)	4,314,710
GP_{PS} Value of all local government property associated with public schools	7,300,000

Real-Estate Taxes Foregone through the Tax-Exempt Status of the University

Andrews University is situated on 1,300 acres owned by the University, and, in addition, owns a certain amount of land and a number of houses outside this 1,300 acres. Every building and industry situated on the 1,300 acres except for Apple Valley Market is tax free. If this property were not owned and used by an educational institution, it could be assumed that it would be farm land as that is what it was when the University purchased the acreage.

To determine the amount of real-estate taxes on this property lost to the government because of the tax free status of educational institutions, the total amount of real-estate taxes collected by the local governments ($2,250,720) was multiplied by the ratio of .039 (1,300 acres divided by 33,280, the total number of acres in the local school district), giving a figure of approximately $87,919. This figure

TABLE XXXVII

Model G-4

$(RF_{RE})_C$

Real-Estate Taxes Foregone through the Tax-Exempt Status of the University

$$(RF_{RE})_C = [R_{RE} - (R_{RE})_C] \left(\frac{G_C}{G_L}\right) - (R_{RE})_C$$

$87,919

R_{RE}	Total real-estate taxes collected by local governments	2,250,720
$(R_{RE})_C$	Real-estate taxes paid to local governments by the University	-0-
G_C	Geographical area of the University	1,300 acres
G_L	Geographical area of the local environment, exclusive of the University	33,280 acres

represented the approximate loss to the government in real-estate taxes for the year 1977. This model dealt only with tax-exempt lands owned by Andrews University for which no taxes were paid. The lands which were taxed were not included in this figure.

Value of Municipal-Type Services Self-Provided by the University

Most universities are situated in a city and depend on the city to provide a certain amount of municipal type services such as: police and security, sanitation, street lighting, and water. Since it is not within the village of Berrien Springs, Andrews University provides these municipal-type services for the campus residents. An enumeration of the value of these self-provided services is detailed in table XXXVIII.

The University security force cost Andrews University approximately $35,000 for the year 1977. It should be pointed out that the local township probably spends less money on police services in the local area due to the nature of the University. Since it is a religious institution, it attracts a more stable type of student and therefore creates a quieter, more reliable environment. The University provides its own sanitation--sewage and garbage disposal--at a cost of $6,323; and street

TABLE XXXVIII

Model G-5

$(OC_M)_{SC}$

Value of Municipal-Type Services Self-Provided by the University

Police and security services	$35,119
Sanitation	6,322
Street lighting and maintenance	16,104
Water	398
Total	$57,943

lighting and maintenance at a cost of $16,000. Water needs for the campus are met by a well installed on the University property and the cost to the University ($398) recorded in the table represents only the cost of the electricity used to operate the pump.

Number of Local Jobs Attributable to The Presence of the University

The information needed to determine the number of local jobs attributable to the presence of the University is compiled in table XXXIX. The computation of the formula showed a total of 2,393 jobs that would not exist if it were not for the University. This included teaching positions and duties executed by University faculty and staff, managerial positions and service opportunities made available by the University owned and operated industries, and also included government and local business service positions created by the presence of the University in

TABLE XXXIX

Model I-1

J_L

Number of Local Jobs Attributable to the Presence of the University

	A	B
$J_L = F + (j)\,[(E_L)_{CR} + (OC_{M,PS})_{CR}]$	1,899	494
F Total number of faculty and staff	968	
j Full-time jobs per dollar of direct expenditures in the local environment	0.00008	
$(E_L)_{CR}$ University-related local expenditures (Model B-1.1)	$11,408,781	$ 6,169,839
$(OC_{M,PS})_{CR}$ Operating cost of government-provided municipal and public school services allocable to University-related influences (Model G-2)	227,130	

the local area. A total of 1,422 jobs were created in the economy outside of the University. The full-time job-per-dollar of direct expenditure in the local environment was equal to .00008, or one job per approximately $12,500. In other words, for every $12,500 expended by the University and the local government, one job was created.

Personal Income of Local Individuals From University-Related Jobs And Business Activities

Table XL relates the personal income developed in the local area because of the University. To calculate this figure, the gross compensation paid to the faculty, staff, and students along with University related local government expenditures, was multiplied by a multiplier factor of .66, a figure suggested by Caffrey and Isaacs (1971). The amount that the local income for individuals has been increased totals approximately $16,000,000.

TABLE XL

Model I-2

PI_{CR}

Personal Income of Local Individuals from University-Related Jobs and Business Activities

	A	B
$PI_{CR} = (f_L)\ (W_F) + (P)\ (E_L)_{CR}$	$16,638,594	$ 4,072,094
f_L Proportion of faculty and staff residing locally (see Model B-1.1.2.1)	0.958	
W_F Gross compensation to faculty and staff	$ 9,508,140	
P Payrolls and profits per dollar of local direct expenditures	0.66	
$(E_L)_{CR}$ University-related local expenditures (Model B-1.1)	$11,408,781	$ 6,169,839

Durable Goods Procured with Income From University-Related Jobs And Business Activities

With the approximately $16,000,000 of personal income, local residents purchase in the local area approximately $490,000 worth of durable goods such as washing machines, refrigerators, automobiles, and other major appliances. This figure was calculated by using a percentage recommended by Caffrey and Isaacs (1971).

TABLE XLI

Model I-3

DG_{CR}

Durable Goods Procured with Income from University-Related Jobs and Business Activities

	A	B
$DG_{CR} = (i)\ (PI_{CR})$	$ 499,158	$ 122,163
i Proportion of total income typically used to purchase durable goods	0.03	
PI_{CR} Personal income of local individuals for University-related jobs and business activities (Model I-2)	$16,638,594	$ 4,072,094

CHAPTER VI

COMPARATIVE OVERVIEW

The Andrews University impact study was compared with three other university impact studies. The three studies chosen for this comparison were: The Economic Impact of Eastern Illinois University in Charleston, Illinois (Bryce, 1975), The Economic Impact of Shippensburg State College on the Local Community (Miklausen, 1975), and Economic Impact of St. Cloud University (Gamber, 1976).

Eastern Illinois University in Charleston, Illinois used the total University-related population for their sample. The return rates were as follows: faculty and staff--15.9 percent, single students--49.7 percent, and married students--33.3 percent. With this low return rate the calculated error rate was near 50 percent in two out of the three areas. It should be pointed out that of the 723 student respondants, 67.2 percent indicated that they lived on campus, but when the University records were examined it was found that only 52.3 percent of all students actually lived on campus. This 15 percent difference indicated a high bias in the respondants.

The Shippensburg study ignored the amount spent in the local area by the University and concerned itself only with the amount spent by the faculty and staff. The total faculty and staff expenditure was multiplied by 1.75, a conservative figure as compared to the ACE (Caffrey & Isaacs, 1971) recommended figure of 2.05. When the total consumer expenditure of

$13,790,823 was multiplied by 1.75 the result was $24,133,936. The taxes paid and the visitor expenditures were enough to increase that figure to $28,890,610.

The Shippensburg study had a response rate of 49 percent for the faculty and 15 percent for the staff. This is a very low percentage. They were, however, able to obtain a 100 percent response from the students sampled.

St. Cloud University sampled 10 percent of the student body and the full faculty and staff population. The St. Cloud study, however, failed to mention the response rate obtained with their instrument. By comparison, the Andrews University study chose sample sizes which were deliberately as small as possible in an attempt to get as high a response rate as possible.

TABLE XLII

Comparison of the Figures of Three Different Universities

Model	Andrews	Shippensburg	St. Cloud
B-1	$20,079,454	$16,058,650	$57,764,494
B-1.1	11,408,781	8,451,921	27,276,996
B-1.2	1,825,405	1,690,345	9,339,643
B-1.3	6,845,268	5,916,345	21,147,855
B-2	22,867,070	13,419,313	18,782,669
B-2.1	15,613,698	11,492,275	15,316,799
B-2.2	2,409,534	1,927,038	2,310,580
B-2.3	4,863,838	N.A.	1,155,290
B-3	5,722,387	3,541,268	5,224,598
B-4	6,628,783	2,472,000	4,066,113
G-1	1,259,739	1,669,675	2,194,805
G-2	227,130	4,071,238	3,827,015
G-3	342,592	10,631,780	11,498,136
G-4	87,919	2,136	251,678
G-5	57,943	213,246	112,816
I-1	jobs 1,899	jobs 1,941	jobs 3,417
I-2	$16,638,594	$17,571,345	$31,203,283
I-3	499,158	2,384,263	748,879

The two studies, out of all the studies examined, which followed the ACE models the closest were the St. Cloud and the Shippensburg studies. These two studies were used in the following tables for comparison purposes.

Table XLII is a comparison between the dollar figures of each of the three universities. These figures are of some value for comparison purposes, but it is far more valuable to calculate and compare the ratios, as the ratio depicts the relationship of each area to the total for each university study.

Table XLIII shows the ratios as based on model B-1. The figures from each of the models were divided by the model B-1 figure. A study of the table shows considerable discrepancy between the three institutions, particularly in the ratios for models B-2, B-3, B-2.2, and B-2.3.

TABLE XLIII

Ratios of the Models Compared to B-1

Models	Andrews	Shippensburg	St. Cloud
B-1	1.000	1.000	1.000
B-2	1.139	0.8356	0.325
B-2.1	0.778	0.7156	0.265
B-2.2	0.120	0.12	0.04
B-2.3	0.242	N.A.	0.020
B-3	0.285	0.221	0.0904
B-4	0.330	0.154	0.0704
G-1	0.0627	0.104	0.038
G-2	0.011	0.2535	0.0663
G-3	0.017	0.662	0.199
G-4	0.00438	0.00013	0.00436
G-5	0.00289	0.0133	0.00195
I-1	0.0000946	0.000121	0.000059
I-2	0.829	1.094	0.5402
I-3	0.0249	0.1485	0.01296

TABLE XLIV

Ratios of the Models Compared to B-1.1

Model	Andrews	Shippensburg	St. Cloud
B-1 + B-2	3.764	3.488	2.7064
B-1	1.76	1.9	2.018
B-1.1	1.00	1.00	1.00
B-1.2	0.16	0.20	0.342
B-1.3	0.60	0.70	0.775
B-2	2.004	1.588	0.689
B-2.1	1.369	1.360	0.562
B-2.2	0.211	0.288	0.0847
B-2.3	0.426	N.A.	0.04204
B-3	0.502	0.419	0.192
B-4	0.581	0.292	0.149
G-1	0.110	0.198	0.0805
G-2	0.0199	0.482	0.140
G-3	0.0300	1.26	0.422
G-4	0.00771	0.00025	0.00923
G-5	0.00508	0.0252	0.00414
I-1	0.00017	0.00023	0.00013
I-2	1.458	2.08	1.144
I-3	0.0438	0.282	0.0275

For a better understanding, another ratio was calculated, this time based on the total figure for model B-1.1. The results are recorded in table XLIV and show that the ratios for Andrews University fall between the values for the other two schools except for the ratios representing models B-2.3, B-2, B-1.2, B-1.3, G-1, G-2, and G-3.

The low Andrews University ratios for G-1, G-2, and G-3, which are government-related models, can be explained by the fact that Andrews University is situated in a rural area where the cost of government is much lower than that of the city and where the community created by the University is an easier community to govern due to the type of people attracted to a university area and also because of the fact that there are very few University-related students in the local public schools.

This last fact lowers the amount of money spent by the school district for Andrews University-related public school students.

Models B-1.2 and 1.3, the multiplier models, were figured to be conservative in the Andrews University study and are therefore less than those of Shippensburg and St. Cloud (see Chapter IV, The Choice of the Multipliers). The Andrews University ratio for model B-2.3 was higher than than of St. Cloud, but there can be no comparison with the Shippensburg study as this particular model was ignored by them. This model is concerned with the non-inventory, non-real-estate value of local businesses. The St. Cloud study did not give a reason for the arbitrary choice of .02, the figure they used in their study for the ebv multiplier (model B-2.3). The total from model B-1 was multiplied by the ebv figure giving a sum of $1,155,290. In table XLIV this was divided by 27,276,996 giving a ratio of .042.

Though the St. Cloud study did not try to determine the actual figures for their community, choosing to set an arbitrary figure instead, the researchers of the Andrews University study made an attempt to get the actual figures from the community. This was not easy as many businesses were not always willing to divulge the figures that they had invested in equipment. It was found that most businesses had at least $10,000, and some of the larger businesses such as Schrader's Supermarket, the automobile dealers, and some of the manufacturers had even larger inventories of up to $100,000 or greater. By averaging these inventories by the number of businesses that were surveyed and making a correction for estimated numbers of the different sizes of businesses, it was estimated that $50,000 was a fairly accurate average figure for equipment outlay in local businesses. When this was worked out on a ratio basis,

a figure of 0.242 was obtained. This was ten times greater than the .02 figure used in the St. Cloud study. This higher figure in the Andrews University study could be due to the fact that even though Berrien County is rural, the 40 mile radius used in the study includes pockets of highly industrialized areas; whereas St. Cloud University is located in more of a rural type community and may not have the industry, and therefore the equipment, that is necessary for manufacturing purposes.

The figures of table XLIV indicate that each of the three universities affect their communities economically in a different way and the way they affect their communities is influenced by the type of communities they are located in. No one university was high in all areas; and conversely, no one university was low in all areas. But each varied according to the local economic base and the purpose and size of the university.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Andrews University, like any other permanent institution is a sector of the economy to which other industries make sales. This is particularly relevant to the community in which it exists because most of Andrews University's operating and expansion funds come from supporters and students whose homes are more than 40 miles from the campus. Thus Andrews University gives its community a continuous influx of money which the community would not otherwise have. This additional money generates other business for the community through a ripple effect.

Of course, the University also has some detrimental effects on its community. These quantified effects can be seen in the form of lost business to University industries and foregone property taxes. Looking at the "benefits" and "costs" individually will make the net difference be more meaningful.

Summary of the Structure of the Study

The study grew out of the need of Andrews University to understand its place within the local economy. The problem of the study was the absence of research delimiting the positive and negative effect of the University. The purpose of the study was to determine the economic dollar impact of Andrews University on the economy within a radius of 40 and 200 miles. The study was based primarily on a paper by the

American Council of Education (Caffrey & Isaacs, 1971) and the Economic Impact of St. Cloud State University (Gamber, 1976). There have been over 70 economic impact studies, according to similar patterns and all have contributed to the increase of the usefulness of this field of study.

A sample of 86 faculty and staff members and 103 students were chosen randomly for the study and just over 90 percent of both groups responded to a questionnaire. The other data for the study were obtained from University and government records and interviews. In the choice of multipliers, conservative options were consistently used. Thus the results of the study, while in a sense estimates, are minimum figures and, in some cases, may in fact be much higher.

Benefits to the Andrews Area Economy

1. The total spending by University-related groups and individuals in the 1976-1977 year was approximately $11,408,781. This University-related spending had an ultimate effect on the local community of approximately $20,079,454 (model B-1, p. 36).

2. Of University-related revenues, approximately $1,259,739 were received by the local governments in the form of taxes and state aid (model G-1, p. 43).

3. An estimated total of 1,081 jobs (other than University faculty and staff) were attributed to the presence of the University. These jobs resulted in approximately $16,638,594 of personal income for local individuals (models I-1, I-2, pp. 56, 57).

4. Local banks' credit base has been expanded approximately $5,722,387 as a result of University-related deposits (model B-3, p. 40).

Costs to the Andrews Area Economy

1. The real-estate taxes foregone by local governments through the tax-exempt status of the University were estimated to be $87,919 (model G-4, p. 54).

2. The operating costs of local governments-provided municipal and public school services allocable to the University-related influences were approximately $227,130. Add this figure to the real-estate taxes foregone and the total is only one-third of the revenues received by the local government because of the University (model G-2, p. 50).

3. The local business volume unrealized because of the existence of University enterprises is estimated to be $6,628,783. This is less than one-third the size of the University-generated business volume (model B-4, p. 42).

Implications

The University total expenditures were $22,604,747 (p. 25) and these resulted in a net gain (benefit-costs, but excluding bank credit base expansion) of $31,033,955 to the local area in the form of business income, local government revenue, and personal income; and $51,025,168 within the area beyond the 40 mile radius but within a 200 mile radius. Thus each dollar spent by Andrews University, on average, adds $1.37 to the local community within 40 miles of the campus and $2.26 to the community beyond the 40 mile radius but within a 200 mile radius of the campus.

This study does not attempt to measure the educational, cultural, moral, aesthetic, and recreational effects of Andrews University on its community, though these would surely be positive, also.

The study, through the use of tested and accepted procedures, developed multipliers consistently below those in other similar studies and yet indicated the net economic impact of the University to be positive in every category--local business, local government, local banks, and local workers all realize greater income as a result of the presence of Andrews University.

Conclusions

Many have asked whether it is an economic advantage or disadvantage to have a university in their community. The study showed that Andrews University, like most other enterprises, is a definite economic advantage to the local community. Its economic impact is definitely and considerably positive. The University creates jobs, enlarges the local credit base, and increases local business volume. Through the payment of its students, staff, and faculty, it increases local tax revenues.

From the data analyzed in this study, the following conclusions may be drawn:

1. The University-related business volume is over three times as large as the local business volume unrealized because of the existence of the University.

2. Within the 200 mile radius of the University, the University-related business volume outside the 40 mile radius is somewhat smaller than that within the 40 mile radius.

3. The expansion of the banks' credit base resulting from University-related business is nearly all within the county.

4. The University-related tax payments are over fourteen times as large as the real-estate taxes foregone through the tax-exempt status of the University.

5. For every University job, the University generated 1.32 jobs in the local economy.

6. For every University student, the University generated 0.45 local jobs (excluding University jobs).

Recommendations

On the basis of the study, the following recommendations are presented:

1. The University should study ways and means of further increasing local spending as compared to spending at a larger distance.

2. The University should consider enlarging its industrial export base.

3. Besides the direct economic impact, Andrews University enriches the area through cultural programs, continuing education offerings, library, recreation, and computer facilities. While this study considers only the economic impact, a further study should be undertaken to examine the other impacts of the University on the local community.

APPENDIX A

DATA SOURCES

APPENDIX A

DATA SOURCES

Area A

Symbol	Information	Where Collected	Amount
t	Local time-deposit reserve requirement	Local bank	0.03
TD_c	Average time-deposit of the University in local banks	University records	$ 411,666
TD_f	Average time-deposit of all faculty, staff, and students in local banks	Survey	4,010,592
d	Local demand-deposit reserve requirement	Local bank	0.1275
DD_c	Average demand-deposit of the University in local banks	University records	$ 420,608
DD_f	Average demand-deposit of all faculty, staff, and students in local banks	Survey	478,626
cbv	Cash-to-business-volume ratio	ACE Model	0.037
pt	Local property tax rate	Local Government	0.04168
V_{PR}	Total assessed valuation of all local private residences	Local Government	$41,370,000
N_{PR}	Total number of local private residences	Local Government	3,200
BV_L	Local business volume	Chamber of Commerce	$36,742,000
V_B	Assessed valuation of local business real property	Local Government	14,285,211
st_{LG}	Proportion of sales tax retained by local government	Local County Government	0.25
ST	Total sales tax collected locally	Local County Government	$ 265,000
A_{PS}	Total state aid to local public schools	School	1,675,894

Area A (Continued)

Symbol	Information	Where Collected	Amount
$(CH_{PS})_S$	Of faculty, staff, and students: number of children attending local public schools	Estimated	50
CH_{PS}	Total number attending local public schools	School District	2,390
POP_{LD}	Total local daytime population	School District	14,720
FH_L	Total number of persons in local faculty and staff households	Survey	6,368
SH_L	Total number of persons in local student households	Survey	4,640
POP_{LR}	Total local resident population	School District	16,000
B_M	Local governments' operating budgets for all municipal services except public schools	Local Government	$ 299,855
$(e_L)_C$	Proportion of total University expenditures that are local, excluding compensation, internal items, and taxes	University records	0.26
E_C	Total University expenditures	University records	$22,604,747
$W_{F,S}$	Gross compensation to faculty, staff, and students	University records	9,508,140
XF_C	Internal account transfers and payments	University records	-0-
R_C	Taxes and other payments to governments	University records	70,000
f_L	Proportion of faculty and staff residing locally	Computor Printout	0.958
f_H	Proportion of local faculty and staff who rent housing	Survey	0.160
e_H	Total disposable income of faculty and staff	University records	$ 3,985,184

Area A (Continued)

Symbol	Information	Where Collected	Amount
e_L	Proportion of total non-housing expenditures that an individual is likely to make in his local environment	Survey	0.9384
$(e_{NH})_F$	Proportion of a consumer's total expenditures spent on non-housing items	Survey	0.766
F	Total number of faculty and staff	Computer Printout	818
$(E_1)_F$	Estimated average local expenditures by each non-local faculty and staff person	Estimated	$ 550
S_L	Number of students obtaining local room and board from dormitories, fraternities, sororities, other groups, or parents excluding married	University	1,518
e_L	Proportion of total expenditures exclusive of room and board, that a student is likely to make in the local environment	Survey	0.750
$(E_m)_S$	Average miscellaneous expenditures, exclusive of room and board, per student of this type	Survey	$ 300
S_H	Number of students renting local housing (not University)	Survey	470
$(E_h)_S$	Average rental housing expenditures per student	Survey	$ 2,076
$(E_{nh})_S$	Average non-housing expenditures per student	Survey	5,542
B_{PS}	Local governments' operating budget for public schools	School District	4,314,710
GP_M	Value of all local government property except public schools	Insurance documents of local government	410,000

Area A (Continued)

Symbol	Information	Where Collected	Amount
GP_{PS}	Value of all local government property associated with public schools	Insurance documents of local schools	$ 7,300,000
R_{RE}	Total real-estate taxes collected by local government	Local Government	2,250,720
G_C	Geographical area of the University	University	1,300 acres
G_L	Geographical area of the local environment, exclusive of the University	Government property tax	33,280 acres
e_L	Proportion of total non-housing expenditures that a student is likely to make in his local environment	Survey	0.964
S_{NL}	Number of non-local students	Survey	30
$(E_1)_S$	Estimated average local expenditures by each non-local student	Survey	$ 720

Area B

Symbol	Information	Where Collected	Amount
$(e_L)_C$	Proportion of total University expenditures that are local, excluding compensation, internal items, and taxes	University records	0.437
e_L	Proportion of total non-housing expenditures that an individual is likely to make in his local environment	Survey	0.099
e_L	Proportion of total non-housing expenditures that a student is likely to make in his local environment	Survey	0.064

APPENDIX B

SAMPLE QUESTIONNAIRE

ANDREWS UNIVERSITY ECONOMIC IMPACT QUESTIONNAIRE

Please check the appropriate blank and return to CSSE, Andrews University, Berrien Springs, MI 49104. Complete only one questionnaire per family.

1. Do you
   - ___own?
   - ___rent?
   - ___live in A.U. housing?
   - ___live with parents?

2. What is the total number of people living in your household?
   - ___1
   - ___2
   - ___3
   - ___4
   - ___5
   - ___6
   - ___7
   - ___8
   - ___9

3. What are your estimated monthly expenditures for:

   Housing (including rent, mortgage, house insurance, utilities):
   - ___$0-100
   - ___$101-150
   - ___$151-200
   - ___$201-250
   - ___$251-300
   - ___$301-350
   - ___$351-400
   - ___$401 & up

   Food:
   - ___$50-100
   - ___$101-150
   - ___$151-200
   - ___$201-250
   - ___$251-300
   - ___$301-350
   - ___$351-400
   - ___$401 & up

4. What is the estimated total annual income of all persons in your household?
   - ___$0-2,999
   - ___$3,000-6,999
   - ___$7,000-10,999
   - ___$11,000-14,999
   - ___$15,000-19,999
   - ___$20,000-24,999
   - ___$25,000-29,999
   - ___$30,000 & up

   What percentage of this comes from Andrews University?
   - ___0-14%
   - ___15-29%
   - ___30-44%
   - ___45-54%
   - ___55-69%
   - ___70-84%
   - ___85-100%

5. What percentage of your total expenditures would you estimate to be spent at University owned businesses (Apple Valley Market, Cafeteria, Student Center, Book Store, Tuition, University Housing, Thomas Market, etc.)?
   - ___0-9%
   - ___10-19%
   - ___20-29%
   - ___30-39%
   - ___40-49%
   - ___50-59%
   - ___60-69%
   - ___70% & up

6. What is the estimated expenditure for out-of-town visitors who visit you (total for year 1977)?
   - ___$0-29
   - ___$30-59
   - ___$60-99
   - ___$100-199
   - ___$200-299
   - ___$300-399
   - ___$400-499
   - ___$500 & up

7. What percentage of your total expenditures is spent (the three should total 100%):

   A. Within Berrien County (St. Joseph, Benton Harbor, Niles, Eau Claire, etc.):
   - ___0-29%
   - ___30-39%
   - ___40-49%
   - ___50-59%
   - ___60-69%
   - ___70-79%
   - ___80-89%
   - ___90-100%

   B. Outside Berrien County but within 40 miles (South Bend, Michigan City, etc.):
   - ___0-9%
   - ___10-19%
   - ___20-29%
   - ___30-39%
   - ___40-49%
   - ___50-59%
   - ___60-69%
   - ___70% & up

   C. Beyond the 40 mile radius:
   - ___0-9%
   - ___10-19%
   - ___20-29%
   - ___30-39%
   - ___40-49%
   - ___50-59%
   - ___60-69%
   - ___70% & up

8. What is the average balance in Berrien County Banks (include Credit Unions and Savings and Loan Associations)?

   A. Checking Balance:
   - ___$0-49
   - ___$50-99
   - ___$100-199
   - ___$200-299
   - ___$300-399
   - ___$400-499
   - ___$500-599
   - ___$600 & up

   B. Savings Balance:
   - ___$0-99
   - ___$100-399
   - ___$400-999
   - ___$1,000-2,999
   - ___$3,000-5,999
   - ___$6,000-9,999
   - ___$10,000-14,999
   - ___$15,000 & up

9. If you own property in Berrien County, what is it's value?

   A.
   - ___Don't own
   - ___$10-19,999
   - ___$20,000-34,999
   - ___$35,000-44,999
   - ___$45,000-54,999
   - ___$55,000-64,999
   - ___$65,000-79,999
   - ___$80,000 & up

   B. Was this value the
   - ___Market value?
   - ___Assessed value (for taxes)?

10. (FOR STUDENTS ONLY)
    Did your parents move to Berrien County so you could get a Christian education?
    - ___ yes
    - ___ no

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